

Expected pandemic-driven employment changes: a comparison of 2019–29 and 2020–30 projection sets

In September 2020, the U.S. Bureau of Labor Statistics (BLS) published its 2019–29 employment projections. Because these projections did not reflect the potential long-term impacts of the coronavirus disease 2019 (COVID-19) pandemic, BLS developed alternate 2019–29 projections in early 2021, capturing those impacts for selected industries and occupations. These latter projections, based on two alternate pandemic scenarios (moderate impact and strong impact), were followed (in September 2021) by BLS projections for the 2020–30 decade. The present article compares target-year employment levels across these successive sets of projections, focusing on the industries and occupations identified in the alternate projections and discussing relevant developments associated with the COVID-19 pandemic.

The coronavirus disease 2019 (COVID-19) pandemic triggered significant economic disruption and swift changes in consumer behavior, business operations, and other facets of economic life. To estimate the extent of any pandemic-induced long-term structural changes to the U.S. labor market, the U.S. Bureau of Labor Statistics (BLS) Employment Projections program developed alternate employment projections in early 2021, aiming to supplement the 2019–29 baseline projections published in September 2020.¹ These alternate projections used two different scenarios (and sets of assumptions) to model long-term pandemic impacts.

Because the 2019–29 baseline projections reflected data and research that preceded the pandemic, the alternate scenarios were designed to provide the public with a preliminary assessment of the pandemic's potential impacts



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on long-term employment changes. Specifically, these scenarios sought to identify industries and occupations whose employment trajectories might be subject to higher levels of uncertainty because of the pandemic.

BLS has since produced a set of projections for the 2020–30 period, and this set contains updated data and additional research on the economic impacts of the pandemic.² The main objectives of the present article are to (1) compare the 2020–30 projections with the 2019–29 baseline and alternate projections for selected industries and occupations, (2) identify structural pandemic factors that were discussed in the alternate projections and are also present in the 2020–30 projections, and (3) discuss possible reasons for any differences in results across projection sets.

Background

BLS develops employment projections by using available historical data, statistical and econometric models, and research-based assumptions about the future. These projections focus on long-term structural change, which tends to be gradual. The COVID-19 pandemic was a significant shock to the U.S. economy, not just in its immediate impacts on employment but also in its potential to cause faster-than-usual change in long-term economic trends. As noted previously, the BLS 2019–29 projections released in September 2020 were based on data and research that preceded the pandemic. Because the next projections set was not scheduled to be released until September 2021, BLS determined that, given the rapidly changing pandemic environment, providing updated information sooner would benefit data users. This led to the development of the 2019–29 alternate pandemic scenarios.

These alternate scenarios, which included a moderate impact scenario and a strong impact scenario, were not a full set of projections, because they did not incorporate revisions to the labor force or macroeconomic projections. Instead, they were developed around a specific set of assumptions about consumer and firm behavioral changes sparked or amplified by the pandemic. In the moderate impact scenario, increased telework was assumed to be the primary driver of economic change and to have both direct effects on information technology (IT) infrastructure and services demand and spillover effects from reduced commuting and food and beverage consumption around workplaces. In the strong impact scenario, the changes detailed for the moderate impact scenario were assumed to persist, but the consumer and firm behaviors associated with them were expected to intensify. In addition, in the strong impact scenario, an assumed consumer preference for avoidance of in-person interactions was expected to drive further declines in demand for restaurant dining, travel, and accommodation.

The 2020–30 employment projections, on the other hand, fully implemented the projections process and were not limited to the specific assumptions included in the alternate scenarios. These projections also were based on additional data for 2020, as well as information about pandemic developments up through the finalization of the projections data in June 2021. These developments included signs of economic recovery from the recession that began in February 2020 and ended in April 2020,³ early indications that consumers were keen to resume activities such as dining out and traveling,⁴ and an expected widespread adoption of hybrid workplace models.⁵

Approach

The present analysis examines a selected group of industries and occupations that were highlighted in the *Monthly Labor Review* article documenting the 2019–29 alternate pandemic scenarios.⁶ These industries and occupations cover the following areas:

- Retail trade
- Food and beverage service
- Travel and accommodation
- Medical research and development
- Information technology (IT)

For these areas, the analysis compares target-year employment levels across four sets of projections:

- 2019–29 baseline projections
- 2019–29 moderate impact alternate projections
- 2019–29 strong impact alternate projections
- 2020–30 projections

Because the recession triggered by the COVID-19 pandemic led to low employment levels for the base year of 2020, and because the 2020–30 projections included pandemic recovery (cyclical) growth,⁷ the projected growth rate for total employment for 2020–30 (7.7 percent) was faster than that expected in the 2019–29 baseline projections (3.7 percent). Therefore, differences in growth rates for occupations and industries across projection sets are not always indicative of differences in projected structural change. For this reason, the analysis below examines target-year employment levels across the four sets of projections, evaluating changes in structural demand.

For some industries and occupations discussed in the analysis, structural demand changes linked to the pandemic were expected to continue in the 2020–30 projections, resulting in 2030 employment levels similar to target-year levels in the alternate pandemic scenarios. For some other industries and occupations, the projected employment levels for 2030 more closely matched target-year levels estimated in the 2019–29 baseline projections, because the 2020–30 projections assumed more moderate changes for certain behaviors than did the alternate pandemic scenarios. Finally, for some industries and occupations, differences across projection sets could best be explained by factors unrelated to pandemic-driven changes.

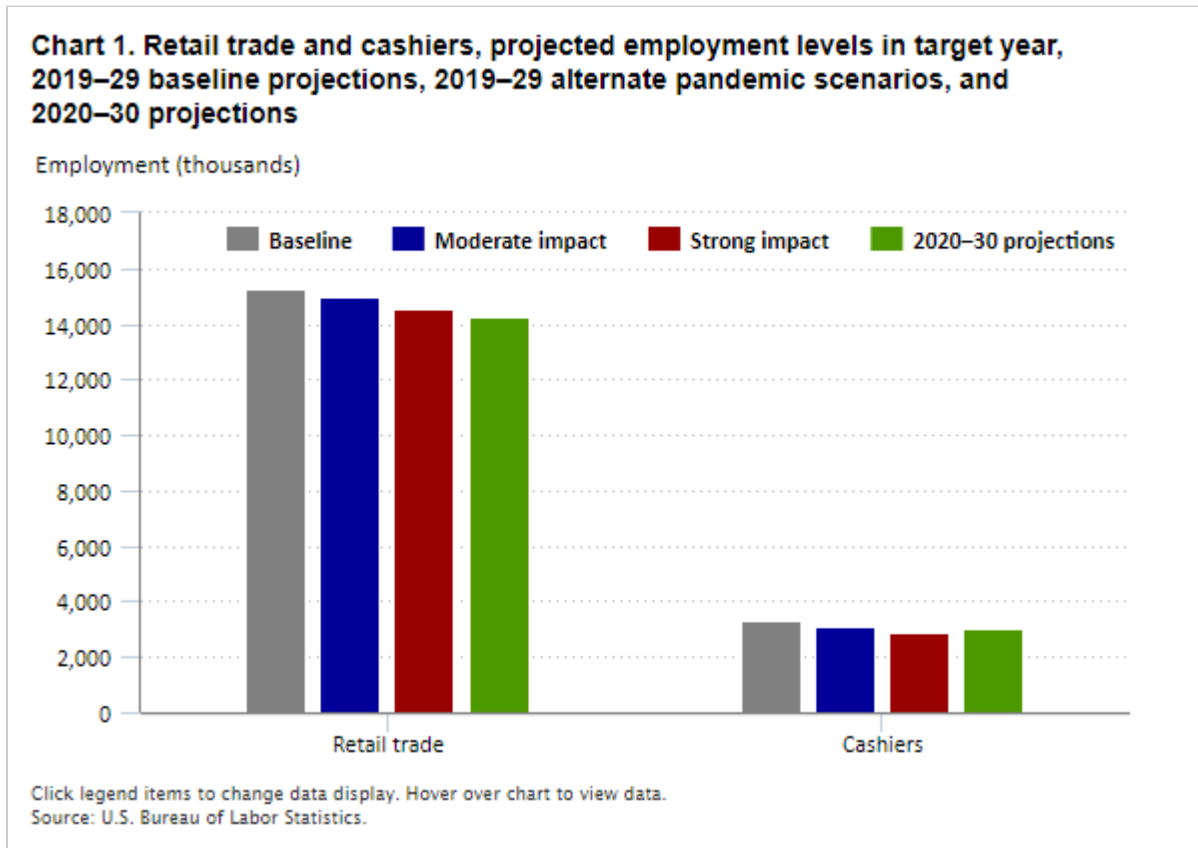
It is important to note that BLS employment projections identify general trends. Each set of projections is developed after inputs and assumptions have been reviewed and updated, which naturally leads to variation in point estimates, even if these estimates reflect the same general trends. Because of the large number of inputs and assumptions in the projections model, it is not possible to identify the specific impact of any one factor on differences in employment levels across projection sets.⁸

Analysis

The analysis below compares target-year employment levels across the four projection sets, focusing on the industry and occupational areas identified in the previous section.

Retail trade

In both alternate pandemic scenarios, the retail trade industry is projected to lose the largest number of jobs among all industries. In the 2020–30 projections, retail trade has a target-year (2030) employment level that is lower than the 2029 levels projected in the moderate and strong impact scenarios, as well as the 2019–29 baseline projections. (See chart 1.)



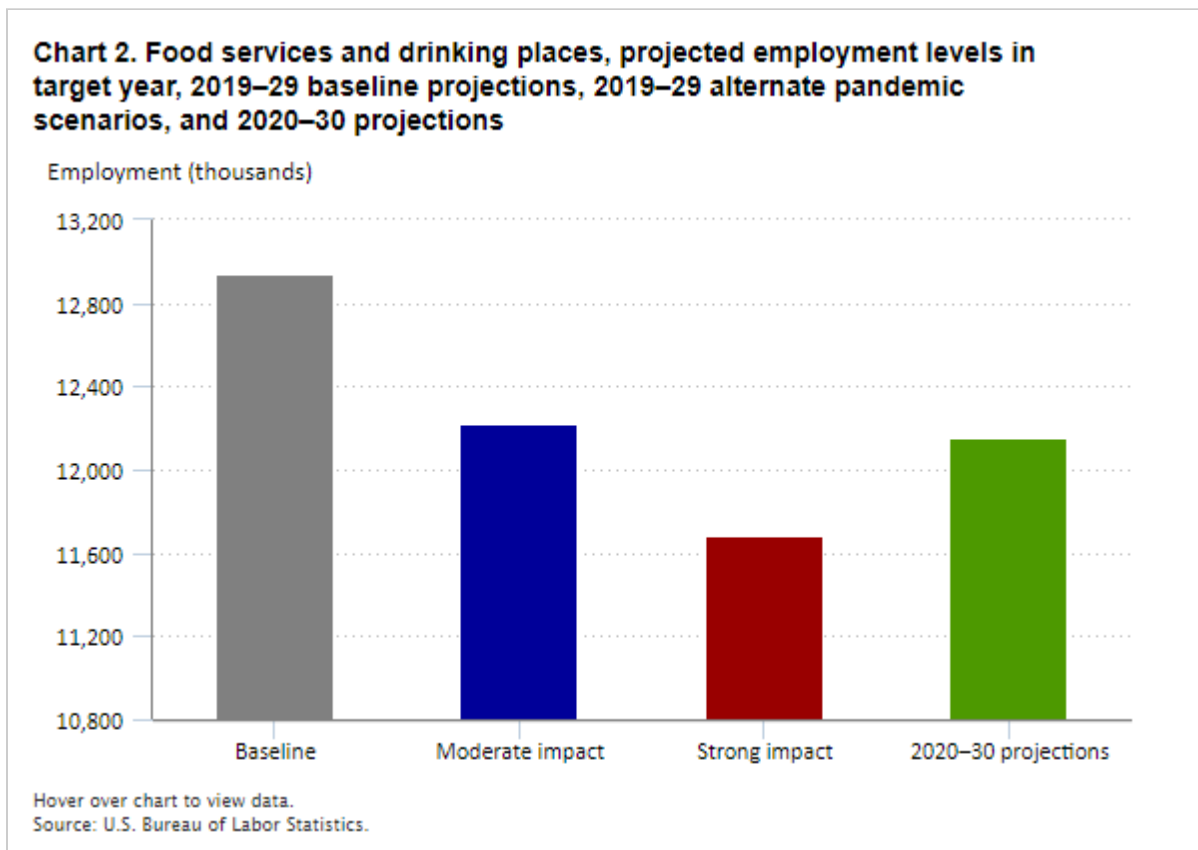
The factors expected to affect employment in retail trade in the alternate pandemic scenarios also result in a projected 2030 employment level for the industry that is notably lower than the target-year level in the 2019–29 baseline projections. Online shopping and “buy online, pickup in-store” (BOPIS) options are expected to continue to grow over the 2020–30 decade, partly because of pandemic-driven changes in consumer shopping preferences.⁹ For example, fiercer online competition is expected to particularly hurt employment in clothing stores, shoe stores, and bookstores. In addition, the automation of checkout positions and the introduction of other forms of contactless transactions, both driven by consumer demand for more convenient forms of shopping, should also weigh on employment in retail trade.

These factors are also expected to affect employment of cashiers, an occupation heavily concentrated in the retail trade sector (in 2020, 83.9 percent of cashier jobs were in that sector). Target-year employment for cashiers in the 2020–30 projections is in line with that in the alternate pandemic scenarios and below that in the 2019–29 baseline projections, indicating that employment in this occupation may be negatively affected by pandemic-induced increases in online shopping and ordering and by further capital–labor substitution associated with automated checkout.

The growth of BOPIS also is expected to affect occupational staffing patterns within retail trade over the 2020–30 projections decade. To help customers shop safely during the COVID-19 pandemic and to reduce the economic impact of lockdown measures, many retailers began to provide or expand their BOPIS offerings, and this retailer response proved to be highly popular among customers. According to one study, about 40 percent of consumers tried a new method of shopping during the pandemic, including using a delivery mobile app or curbside pickup, and of those who did, nearly three-quarters intended to continue to use that method after the pandemic.¹⁰ Before the pandemic, only about 7 percent of the 500 largest retailers with stores in the United States offered curbside pickup; however, by mid-2020, nearly 44 percent did.¹¹ Because BOPIS allows for contactless payment either online or through mobile apps, it is expected to further reduce the employment demand for cashiers. Conversely, stockers and order fillers are expected to be in greater demand because of the need to pack and prepare online orders for in-store pickup.

Food and beverage service

Employment in the food services and drinking places industry is expected to be roughly 12.16 million in 2030, similar to the 2029 level expected in the moderate impact scenario and considerably lower than the target-year level of 12.94 million expected in the 2019–29 baseline projections. (See chart 2.)



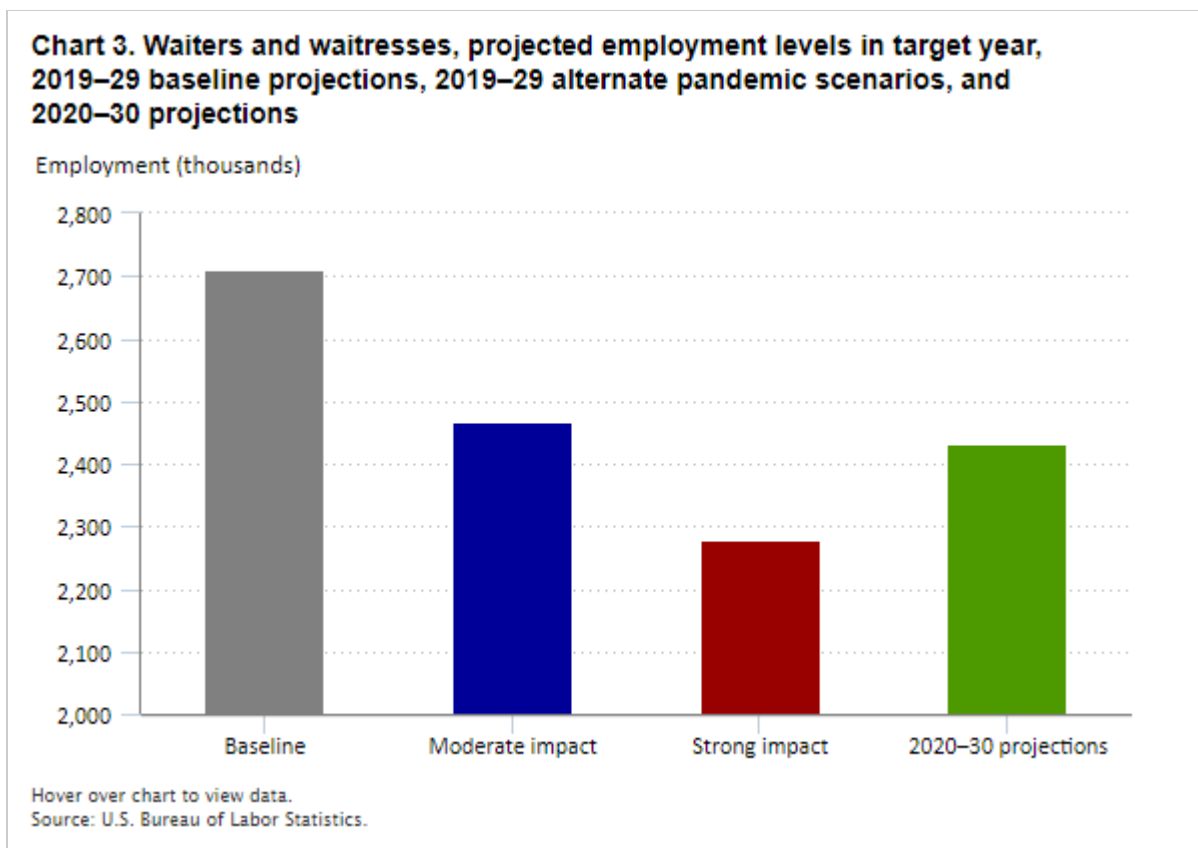
The pandemic-related factors expected to affect food and beverage service industries and occupations in the alternate pandemic scenarios are also expected to drive employment changes in the 2020–30 projections. The increased use of remote and hybrid work models during the pandemic is expected to continue after the pandemic, albeit at a rate lower than that seen at the height of the pandemic. This shift in work location (from an office

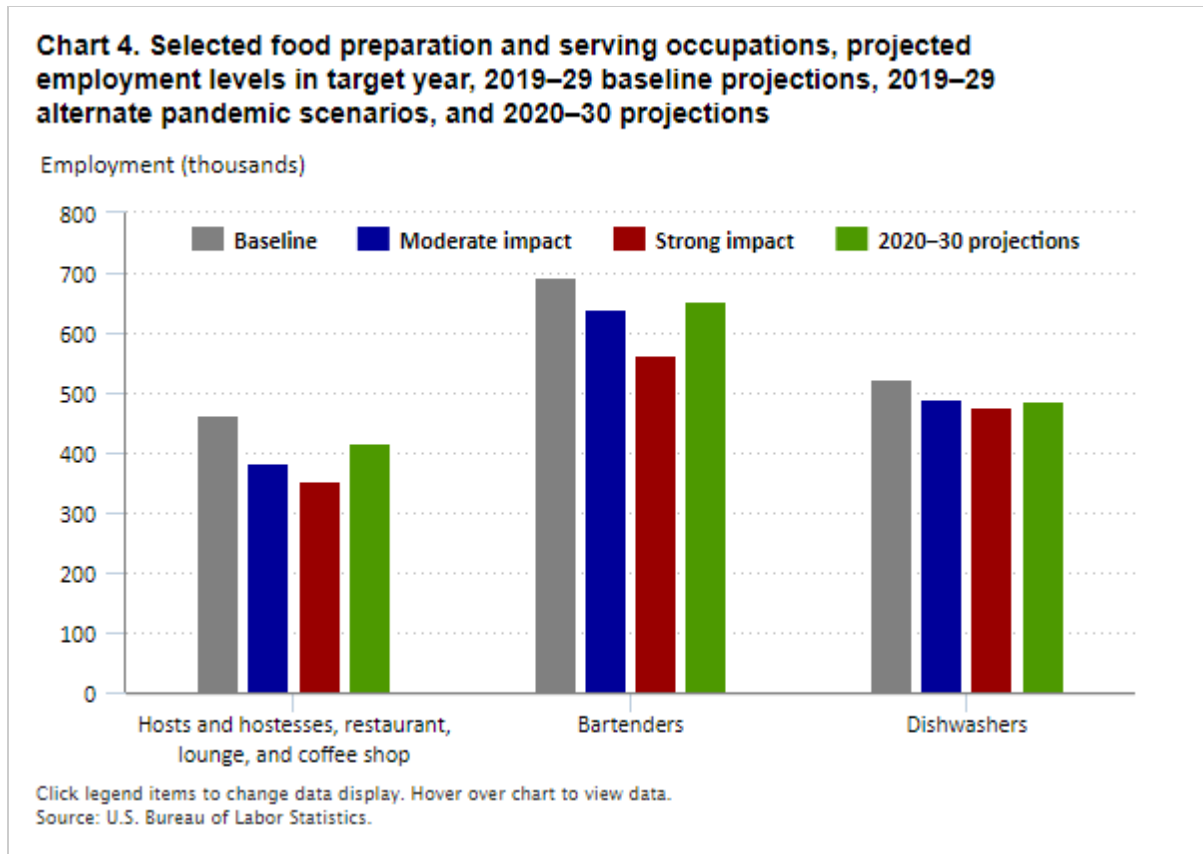
building to one's home) for many workers is expected to negatively affect employment in cafeterias and restaurants, especially those in or near workplaces.

In addition, like retailers, many restaurants and fast-food establishments responded to the pandemic by expanding delivery and takeout services, as well as payment options that have allowed customers to place orders online or through mobile apps. These alternative dining services have gained widespread popularity, accelerating prepandemic changes in consumer dining habits. An estimated 25 percent of all restaurant purchases in 2020 were made via some form of technology, either through online orders using a website or a mobile app or through a third-party delivery service.¹² Given the convenience of digital ordering, takeout and delivery food services are expected to be long lasting.¹³

Another prepandemic trend that has grown rapidly during the pandemic, in step with the demand for meal deliveries, is the increasing use of “ghost” kitchens, which prepare food solely for delivery.¹⁴ Because these kitchens do not cater to patrons and customers—and, hence, do not require front-of-house employees such as waiters and waitresses—their staffing needs are different from those of full-service and fast-food restaurants.

Many food preparation and serving occupations, including waiters and waitresses (the largest occupation in this occupational group), bartenders, and dishwashers, are projected to have 2030 employment levels that are in line with target-year employment levels in the moderate impact scenario. (See charts 3 and 4.) On the other hand, for hosts and hostesses, the projected employment level for 2030 falls between the 2029 employment levels expected in the baseline projections and the moderate impact scenario.



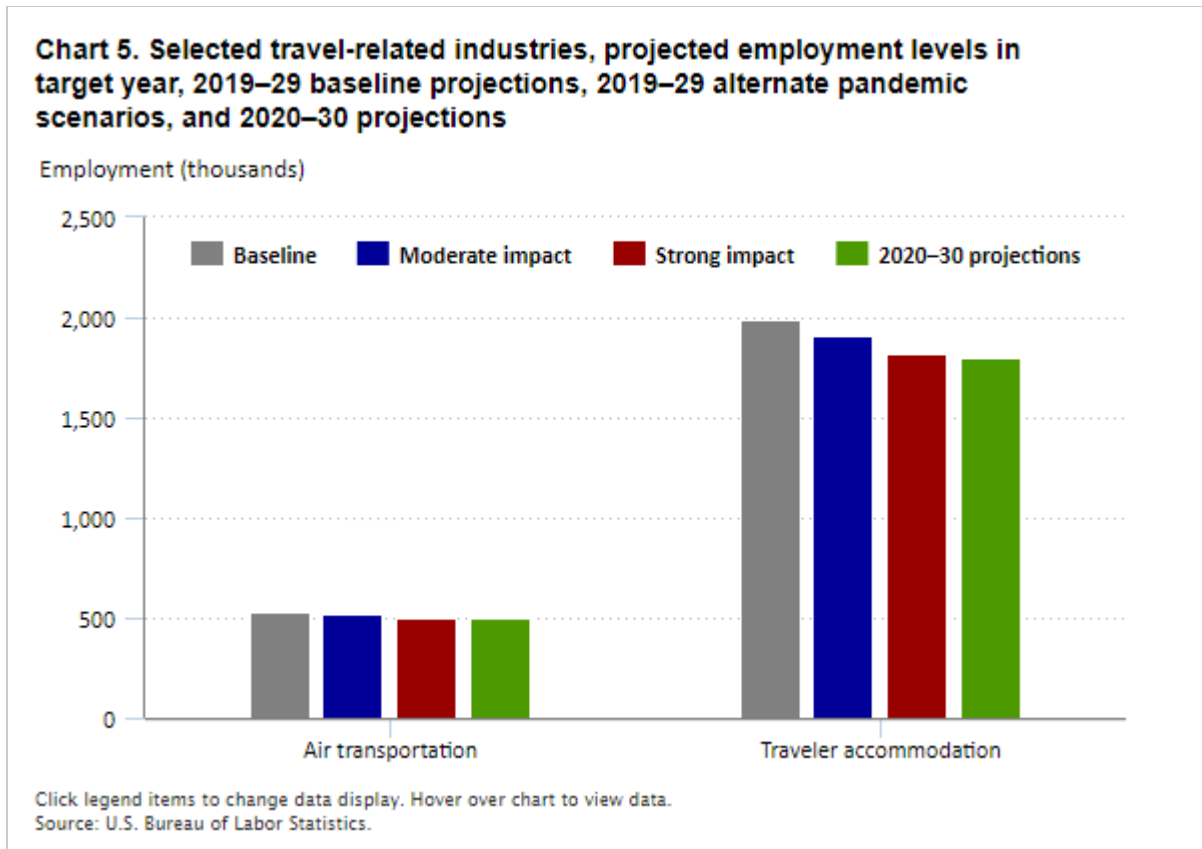


In both the 2020–30 and alternate projections, the accelerated adoption of online ordering and payment systems is expected to be a drag on employment of cashiers and waiter and waitresses in food services and drinking places. In addition, the expected continued rise in delivery and takeout services is projected to reduce demand for waiters and waitresses, hosts and hostesses, bartenders, and dishwashers, especially in full-service restaurants. Because target-year employment in the drinking places (alcoholic beverages) industry is lower in the 2020–30 projections than in the 2019–29 baseline projections, bartenders, who make up nearly 44 percent of workers in this industry, are also expected to see a lower employment level in 2030.

Travel and accommodation

Travel-related industries have been some of the most hard hit by the COVID-19 pandemic. According to BLS Current Employment Statistics data, employment in the traveler accommodation industry fell 27.1 percent from 2019 to 2020, a loss of roughly 544,200 jobs.¹⁵ Likewise, employment in the air transportation industry declined 14.8 percent from 2019 to 2020, a loss of about 74,600 jobs.¹⁶

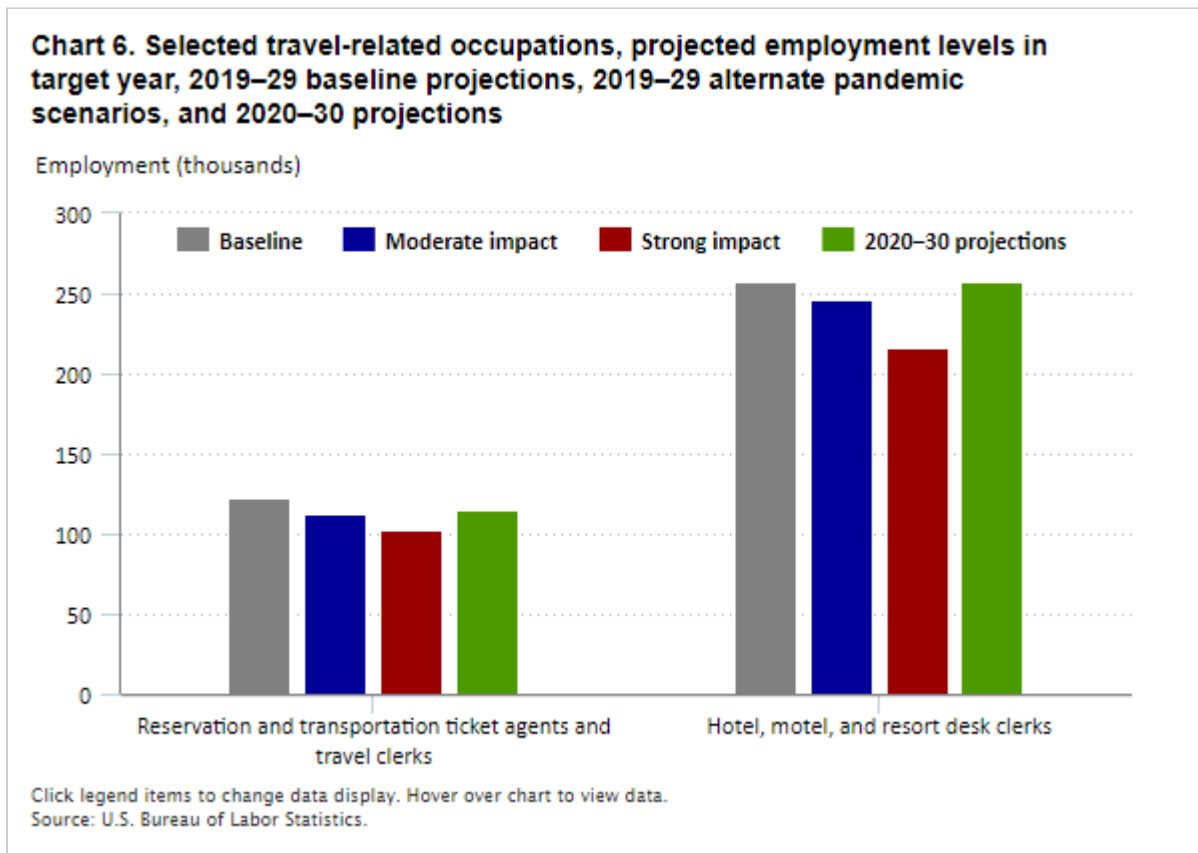
Target-year employment levels for both the traveler accommodation and air transportation industries are similar across the 2020–30 projections and the strong impact scenario. (See chart 5.) However, despite this similarity, the two projection sets are based on slightly different assumptions about travel habits in the target year.



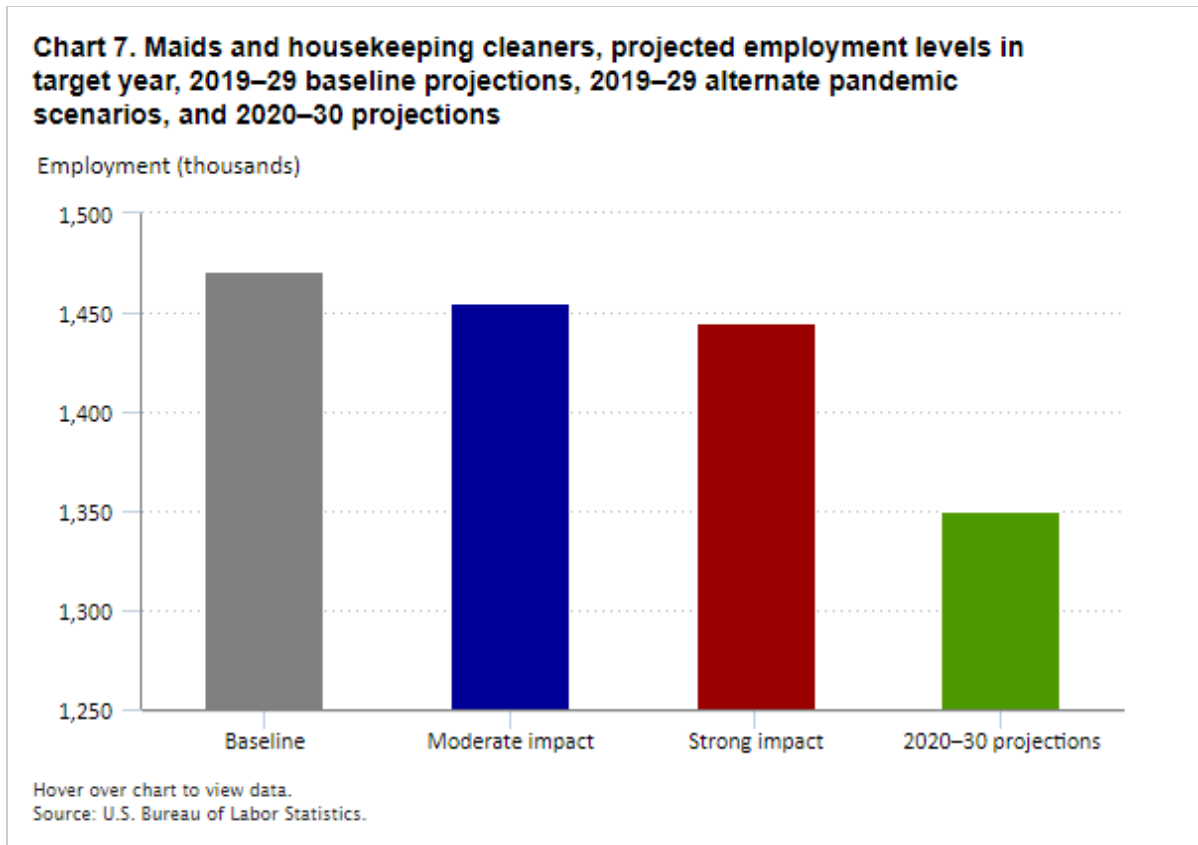
The alternate pandemic scenarios and the 2020–30 projections both expect that, over the long term, reduced business travel will negatively affect employment in the air transportation and traveler accommodation industries. However, the strong impact scenario also expects some sustained reduction in leisure travel due to consumer behavioral changes resulting from a greater perceived risk of travel and persistent health concerns. On the other hand, given available information on the evolution of the pandemic (up to June 2021) and consumer behavioral responses to it, the 2020–30 projections expect leisure travel to fully recover by the target year of 2030. Therefore, the pandemic’s impact on the air transportation and traveler accommodation industries is expected to be weaker in the 2020–30 projections than in the strong impact scenario, and the difference in target-year employment levels for these industries between the 2019–29 baseline projections and the 2020–30 projections can be attributed to several other factors, including the inherent variation in estimates across projection sets.

Expected reductions in business travel are reflected in the projected 2030 employment levels for both the air transportation and traveler accommodation industries. The pandemic has led to extensive use of videoconferencing and virtual meetings, and many companies expect virtual work to persist over the long term.¹⁷ Some forms of business travel, such as those involving ongoing support for existing clients or intracompany meetings and trainings, will likely be more permanently replaced by virtual meetings and videoconferencing.¹⁸ That said, many forms of business travel, such as those for which in-person interaction is considered more advantageous (e.g., business travel for sales, attracting new clientele, and attending conferences and conventions), are expected to return to normal after the pandemic.¹⁹

The 2020–30 projections for travel-related occupations show a range of target-year employment levels relative to the 2029 levels expected in the baseline and alternate projections. Employment of reservation and transportation ticket agents and travel clerks is projected to be about 114,700 in 2030, similar to the 2029 level projected in the moderate impact scenario. (See chart 6.) For the 2020–30 decade, the pandemic is expected to accelerate capital–labor substitution of this occupation with online booking systems and automated kiosks—an acceleration due to travel companies’ responses to the pandemic, such as minimizing in-person interactions and restructuring operations.²⁰ On the other hand, the projected 2030 employment level of hotel, motel, and resort desk clerks is essentially unchanged from the baseline projection for 2029 and is consequently higher than the target-year levels expected in the alternate pandemic scenarios. Although self-service kiosks for customer check-in have been introduced in some motels and hotels, particularly in large hotel chains, this technology is not expected to become widespread, and hotel clerks are expected to remain in demand to assist incoming guests. This reassessment for the 2020–30 projections was based on further research into automated technologies, the current rate of their adoption by hotels and motels, and certain occupation-specific customer service responsibilities that are not easily automated.



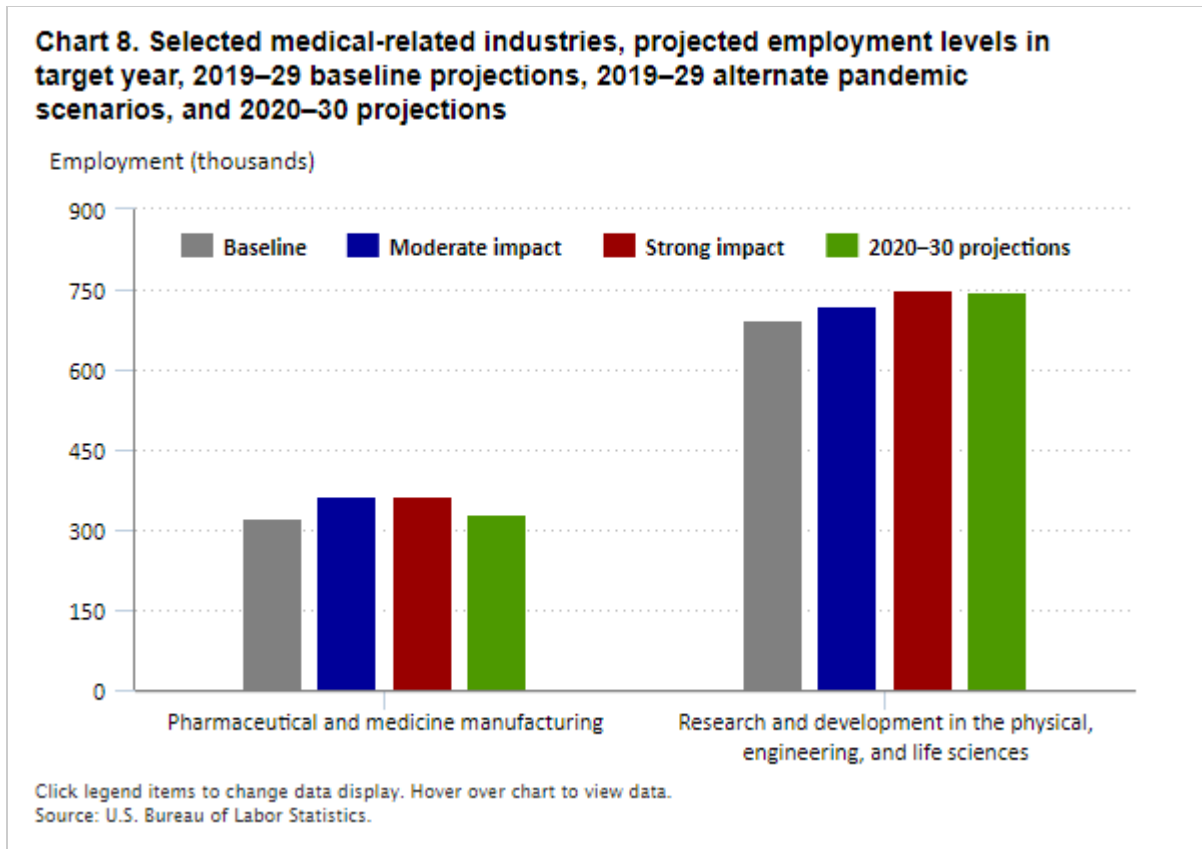
Employment of maids and housekeeping cleaners is projected to be approximately 1.35 million in 2030, considerably lower than the 2029 level of about 1.47 million in the 2019–29 baseline projections and below the target-year levels in both alternate pandemic scenarios. (See chart 7.) In the 2020–30 projections, pandemic-induced reductions in cleanings of rooms occupied by the same customers over multiple days are expected to persist in the long term, reducing demand for hotel housekeeping cleaners.²¹



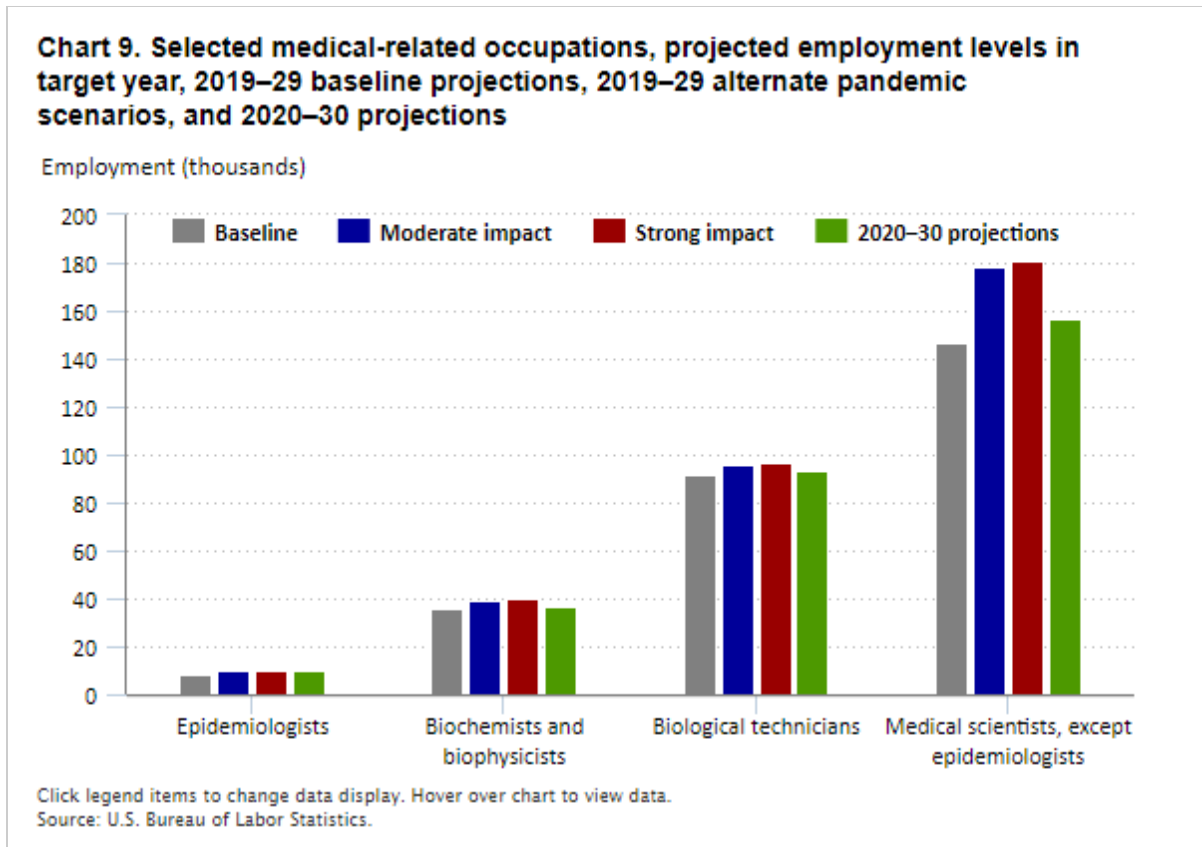
Medical research and development

The COVID-19 pandemic has generated higher public demand for medical and scientific research and development related to infectious diseases. Finding ways to mitigate viral spread and developing treatments and vaccines have been areas of increased public interest in the wake of the pandemic. A Harvard T.H. Chan School of Public Health survey conducted in February–March 2021 found that 71 percent of those surveyed supported “substantially increasing federal spending on improving the nation’s public health programs” and that 72 percent thought “activities of public health agencies in the United States are extremely or very important to the health of the United States.”²² The American Rescue Plan Act of 2021 included \$7.5 billion in funding for the Centers for Disease Control and Prevention for vaccine distribution and administration, along with additional funding for the U.S. Department of Health and Human Services for research and development in the areas of vaccines and therapeutics.²³

Employment in research and development in the physical, engineering, and life sciences industry is projected to be roughly 746,000 in 2030, in line with the 2029 level expected in the strong impact scenario. (See chart 8.) In both the 2020–30 and alternate projections, increased demand for treatments and vaccines also translates into higher pharmaceutical and medicine manufacturing employment, whose 2030 level is projected to be slightly higher than the target-year level in the 2019–29 baseline projections but lower than the 2029 levels in the alternate pandemic scenarios.



Within medical-related occupations, employment of epidemiologists is expected to reach a 2030 level similar to the 2029 levels projected in the alternate pandemic scenarios. (See chart 9.) Medical scientists are projected to have a 2030 employment level lower than the target-year levels projected in the alternate pandemic scenarios, but still higher (by about 10,000 jobs) than the 2029 level expected in the baseline projections.



The other occupations related to medical research and highlighted in the alternate pandemic scenarios are biochemists and biophysicists, and biological technicians. Employment of biochemists and biophysicists is projected to reach about 36,500 in 2030, close to the 2029 level of approximately 36,000 in the 2019–29 baseline projections. Employment of biological technicians is expected to be roughly 93,500 in 2030, which is between the target-year levels expected in the baseline projections (91,800) and the moderate impact scenario (95,600). For these occupations, then, the increased public demand for research into infectious diseases leads to projected 2030 employment levels that are higher than the 2029 levels expected in the baseline projections, but lower than the target-year levels expected in the alternate pandemic scenarios.

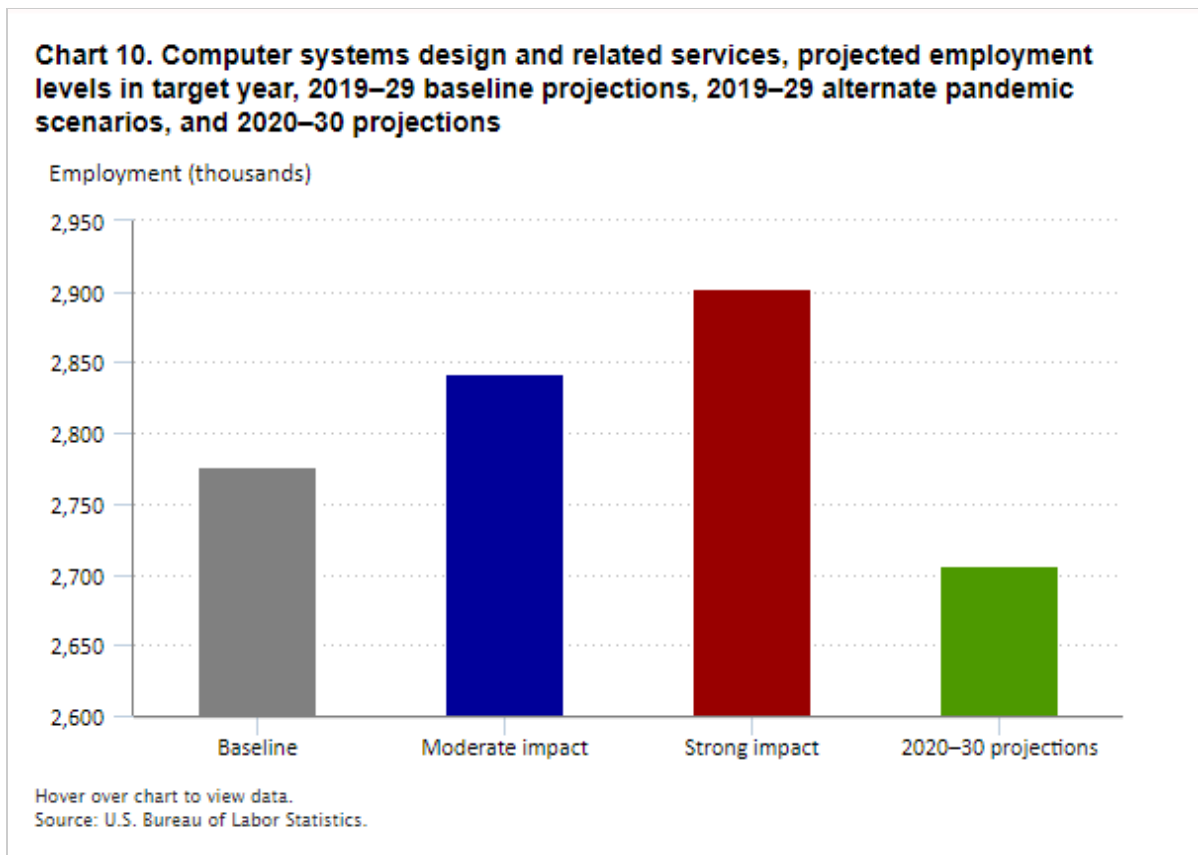
Information technology

In the alternate projections, expanded telework is one of the key assumptions underlying both the moderate and strong impact scenarios. With part of the workforce shifting toward remote work, demand for computer and information technology (IT) services, particularly those related to IT security, is expected to rise and, in turn, drive strong employment growth (in both scenarios) in the computer systems design and related services industry.

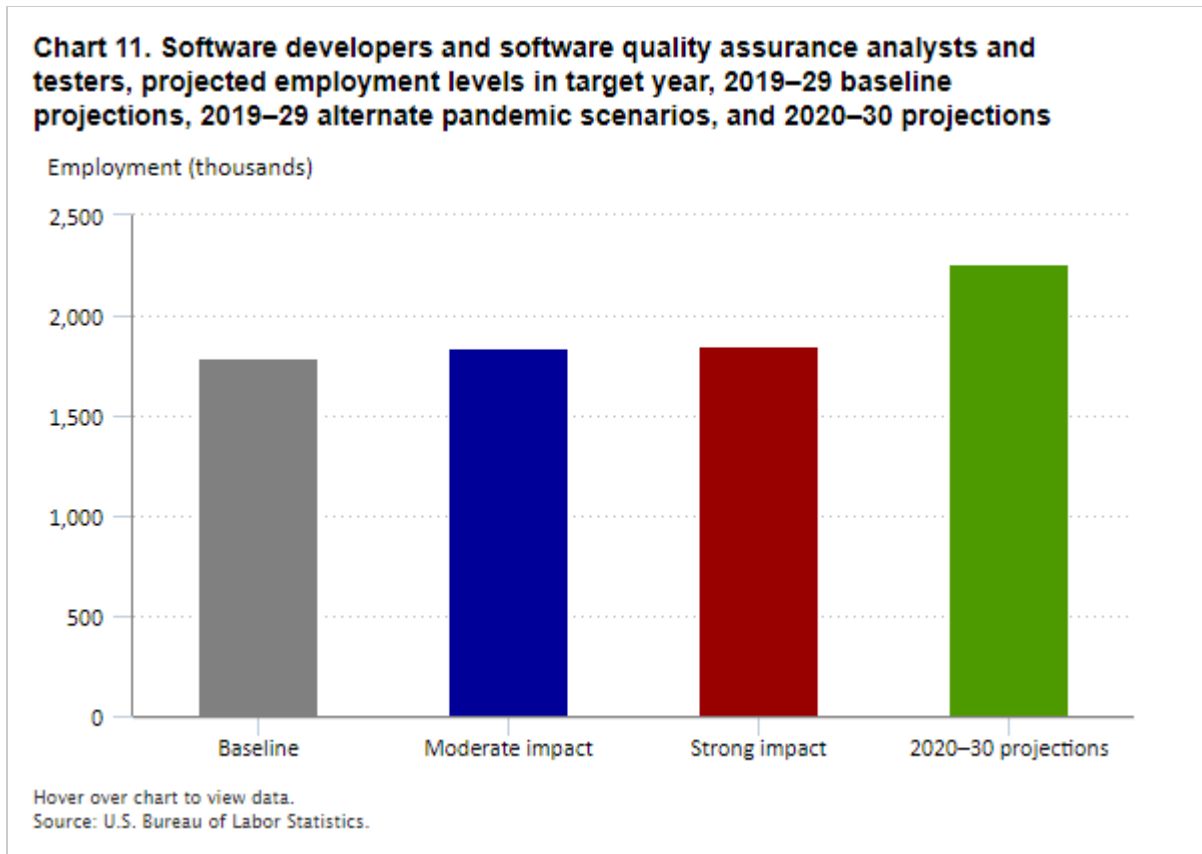
In the 2020–30 projections, expanded telework is also expected to be a lasting long-term factor affecting IT employment demand, because an increasing number of employers have announced plans to offer remote work permanently.²⁴ According to an Ipsos survey conducted for the World Economic Forum, most of the employed people surveyed “want flexible working to become the norm,” and 30 percent “would consider looking for another job if they were forced to go back to the office full time.”²⁵ Expanded remote work has boosted demand for IT

workers, particularly those in the cybersecurity field, because, as noted by one author, “the rise of remote work resulting from pandemic lockdowns has also led to an increase in cybersecurity threats.”²⁶

Although the computer systems design and related services industry is projected to have a 2030 employment level lower than the 2029 levels expected in the baseline projections and the two alternate pandemic scenarios, it is still expected to experience strong job gains over the 2020–30 decade, adding about 518,000 new jobs. (See chart 10.) Unlike the alternate pandemic scenarios, in which increased demand for IT services (partly fueled by expanded telework) is expected to be concentrated in the computer systems design and related services industry, the 2020–30 projections anticipate that this demand will be distributed across the economy and other IT-related industries, including the data processing, hosting, and related services industry.

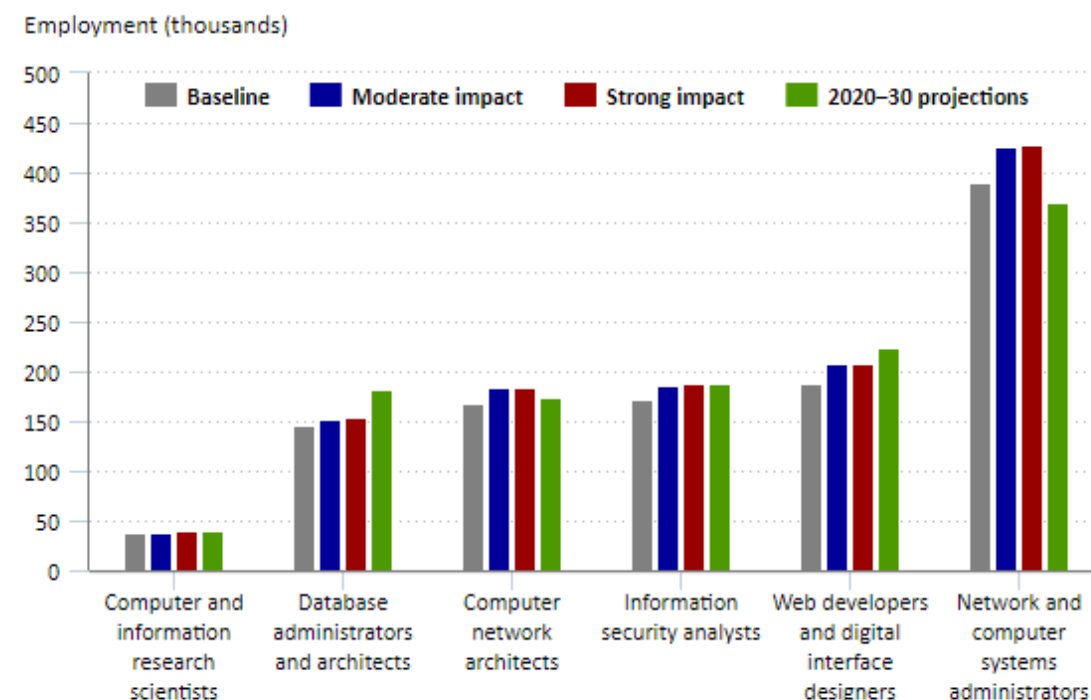


Many of the computer occupations highlighted in the alternate projections are expected to have 2030 employment levels higher than the 2029 levels projected in the moderate and strong impact scenarios. Employment in the largest of these occupations, software developers, is expected to reach approximately 2.26 million by 2030, up notably from the 2029 level of about 1.79 million in the baseline projections and higher than the 1.85 million jobs projected for 2029 in the strong impact scenario. (See chart 11.)



Most of the other computer occupations highlighted in the alternate projections are expected to have 2030 employment levels above the projected target-year levels in the 2019–29 baseline projections. (See chart 12.) One exception is the occupation of network and computer systems administrators, whose projected 2030 employment level is below the 2029 baseline and considerably lower than the target-year levels projected in the alternate pandemic scenarios. Updated research done for the 2020–30 projections suggests that firms will likely take advantage of economies of scale offered by cloud services, which may decrease demand for system administrators.²⁷

Chart 12. Selected computer occupations, projected employment levels in target year, 2019–29 baseline projections, 2019–29 alternate pandemic scenarios, and 2020–30 projections



Conclusion

Although the pandemic's structural economic impact remains highly uncertain, several factors identified in the alternate pandemic scenarios are likely to persist in the long term. Among these factors is increased remote work, which is likely to affect demand for computer and IT services, as well as food services and business travel. The ongoing shift from brick-and-mortar retail to e-commerce is also expected to accelerate, as consumer spending habits established during the pandemic continue over the 2020–30 projections decade. In addition, public demand for medical and scientific research and development is expected to grow, particularly in the area of infectious disease. Given that these factors were identified in the 2019–29 alternate projections and are expected to persist over the 2020–30 period, the alternate pandemic scenarios served their purpose of providing an early look at the potential long-term impacts of the pandemic, with the 2020–30 employment projections validating the direction of most expected impacts.

SUGGESTED CITATION

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NOTES

- ¹ For detailed information on the alternate projections, see Lindsey Ice, Michael J. Rieley, and Samuel Rinde, “Employment projections in a pandemic environment,” *Monthly Labor Review*, February 2021, <https://doi.org/10.21916/mlr.2021.3>. For detailed information on the 2019–29 baseline projections, see Kevin S. Dubina, Janie-Lynn Kim, Emily Rolen, and Michael J. Rieley, “Projections overview and highlights, 2019–29,” *Monthly Labor Review*, September 2020, <https://doi.org/10.21916/mlr.2020.21>.
- ² Kevin S. Dubina, Lindsey Ice, Janie-Lynn Kim, and Michael J. Rieley, “Projections overview and highlights, 2020–30,” *Monthly Labor Review*, October 2021, <https://doi.org/10.21916/mlr.2021.20>.
- ³ “U.S. business cycle expansions and contractions” (Cambridge, MA: National Bureau of Economic Research, last updated July 19, 2021), <https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions>.
- ⁴ Tamara Charm, Janette Hwang, Jackie Laird, Nancy Lu, Jason Rico Saavedra, Andrea Leon, Daniela Sancho Mazzara, Anirvan Maiti, Kelsey Robinson, and Tom Skiles, “U.S. consumer sentiment and behaviors during the coronavirus crisis” (McKinsey & Company, December 14, 2021), <https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/survey-us-consumer-sentiment-during-the-coronavirus-crisis>.
- ⁵ Dinesh Malkani, “Going hybrid: the future of work is here,” *Forbes*, June 4, 2021, <https://www.forbes.com/sites/forbestechcouncil/2021/06/04/going-hybrid-the-future-of-work-is-here/?sh=28b7e5ab2cb9>.
- ⁶ Ice, Rieley, and Rinde, “Employment projections in a pandemic environment.”
- ⁷ In this discussion, cyclical change refers to short-term business cycle fluctuations around a trend. For example, employment may decline in a particular industry during a recession (cyclical decline) and grow during the recovery immediately following the recession (cyclical growth), eventually returning to the long-term trend. Structural change refers to the long-term trend and, in the case of employment, reflects changes in the allocation of employment by industry and occupation. Structural changes in industry or occupational employment are based on factors such as changes in consumer preferences that affect the demand for goods and services or new technology that affects production practices.
- ⁸ For detailed information on the employment projections methodology, see “Employment projections methods overview,” *Employment Projections* (U.S. Bureau of Labor Statistics), <https://www.bls.gov/emp/documentation/projections-methods.htm>.
- ⁹ “Click-and-collect 2021: buy online, pick-up in store (BOPIS) industry trends,” *Business Insider*, May 5, 2021, <https://www.businessinsider.com/click-and-collect-industry-trends>; and Michael Ketzenberg and M. Serkan Akturk, “How ‘buy online, pick up in-store’ gives retailers an edge,” *Harvard Business Review*, May 25, 2021, <https://hbr.org/2021/05/how-buy-online-pick-up-in-store-gives-retailers-an-edge>.
- ¹⁰ Tamara Charm, Becca Coggins, Kelsey Robinson, and Jamie Wilkie, “The great consumer shift: ten charts that show how U.S. shopping behavior is changing” (McKinsey & Company, August 2020), p. 4, <https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Marketing%20and%20Sales/Our%20Insights/The%20great%20consumer%20shift/ten-charts-show-how-us-shopping-behavior-is-changing.pdf>.
- ¹¹ Ketzenberg and Akturk, “How ‘buy online, pick up in-store’ gives retailers an edge”; and April Berthene, “Nearly 44% of Top 500 retailers with stores now offer curbside pickup,” *Digital Commerce 360*, September 30, 2020, <https://www.digitalcommerce360.com/2020/09/30/nearly-44-of-top-500-retailers-with-stores-now-offer-curbside-pickup/>.
- ¹² Matt Drewes, “5 dining trends left behind by COVID-19,” *Fast Casual*, April 5, 2021, <https://www.fastcasual.com/blogs/5-dining-trends-caused-by-covid-19/>.
- ¹³ “Restaurant trends that are here to stay post-pandemic,” *Restaurantware*, June 17, 2021, <https://www.restaurantware.com/blog/post/restaurant-trends-that-are-here-to-stay-post-pandemic/>.
- ¹⁴ Hudson Riehle, Bruce Grindy, Denise Roach, Beth Lorenzini, and Daniela Smith, *Restaurant industry 2030: actionable insights for the future* (Washington, DC: National Restaurant Association, November 2019), p. 32, <https://restaurant.org/nra/media/>

[restaurant-2030/restaurant2030.pdf](#); and Michelle Cheng, “Ghost kitchens are becoming a very real business,” *Quartz*, July 16, 2021, <https://qz.com/2032957/ghost-kitchens-are-becoming-a-very-real-business/>.

¹⁵ Not seasonally adjusted data for travel accommodation (all employees) for 2019 and 2020; see “CES national databases,” *Current Employment Statistics—CES (national)* (U.S. Bureau of Labor Statistics), <https://www.bls.gov/ces/data/>.

¹⁶ Not seasonally adjusted data for air transportation (all employees) for 2019 and 2020; see “CES national databases,” *Current Employment Statistics—CES (national)* (U.S. Bureau of Labor Statistics), <https://www.bls.gov/ces/data/>.

¹⁷ Malkani, “Going hybrid.”

¹⁸ Ben Baldanza, “Up to 36% of airline business travel won’t return after Covid pandemic ends, study estimates,” *Forbes*, December 1, 2020, <https://www.forbes.com/sites/benbaldanza/2020/12/01/new-study-estimates-up-to-36-of-airline-business-travel-wont-return/?sh=389d89ee4cf1>.

¹⁹ Ibid.

²⁰ Laurie Garrow, Lavanya Marla, and John-Paul Clarke, “Airline response to COVID-19,” *ORMS Today*, February 2, 2021, <https://doi.org/10.1287/orms.2021.01.20>.

²¹ Bailey Schulz, “Where are the housekeepers? COVID-19 guidelines, labor shortage affect hotel housekeeping service,” *USA Today*, July 7, 2021, <https://www.usatoday.com/story/travel/hotels/2021/07/07/hotel-housekeeping-service-available-upon-request/7894656002/>.

²² “Poll: public supports substantial increase in spending on U.S. public health, but has concerns about how the system functions now” (Boston, MA: Harvard T.H. Chan School of Public Health, May 13, 2021), <https://www.hsph.harvard.edu/news/press-releases/poll-public-supports-substantial-increase-in-spending-on-u-s-public-health-but-has-concerns-about-how-the-system-functions-now/>.

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²⁴ Kristin Stoller, “Never want to go back to the office? Here’s where you should work,” *Forbes*, January 31, 2021, <https://www.forbes.com/sites/kristinstoller/2021/01/31/never-want-to-go-back-to-the-office-heres-where-you-should-work/?sh=6f56e3be6712>.

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